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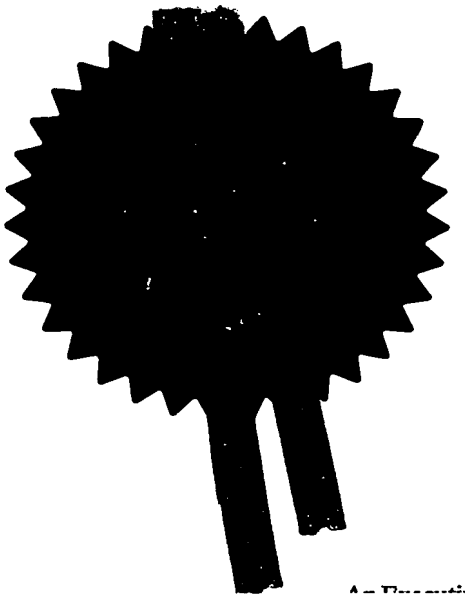

Signed 

Dated 10 November 2004

Patents Form 1/77

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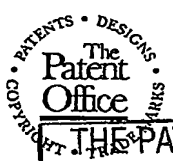

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference — ngr.3150.uk.cr.d

2. Patent application number *(The Patent Office will fill in this part)* — 0323881.3 — 11 OCT 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Neil William Graham
Flat 2/1
8 Auldhouse Avenue
GLASGOW
G43 1DN

Patents ADP number *(if you know it)* 87317 05001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention — Novel occlusive dressing

5. Name of your agent *(if you have one)*

Kennedys Patent Agency Limited
Floor 5, Queens House
29 St Vincent Place
Glasgow
G1 2DT

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Patents ADP number *(if you know it)* 08058240002 ✓

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

No

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	9
Claim *(s)*	
Abstract	
Drawing *(s)*	2 + 2 fm.

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Kennedys — Date **10 October 2003**

KENNEDYS

12. Name and daytime telephone number of person to contact in the United Kingdom — **Claire Rutherford** — **Tel: 0141 226 6826**

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Notes

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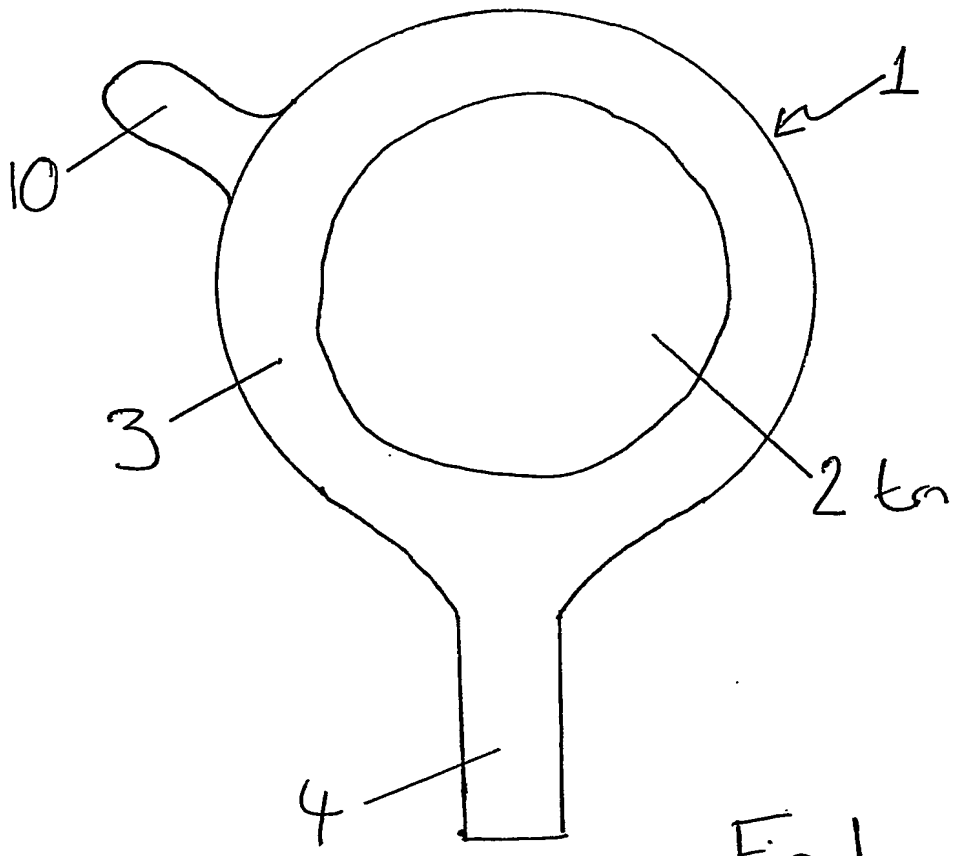

Fig 1

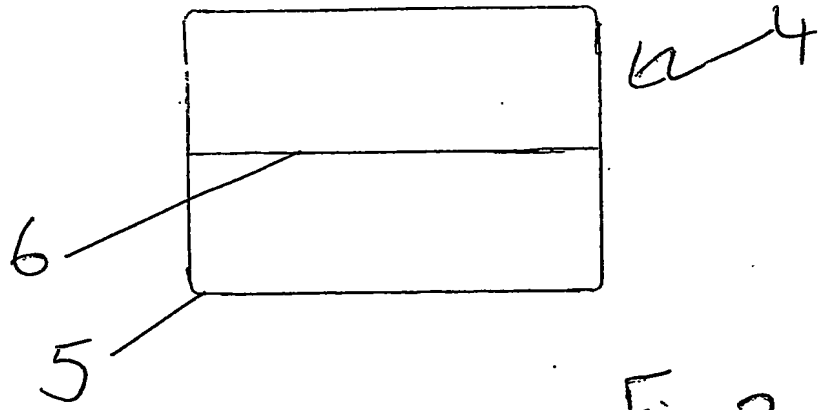

Fig 2

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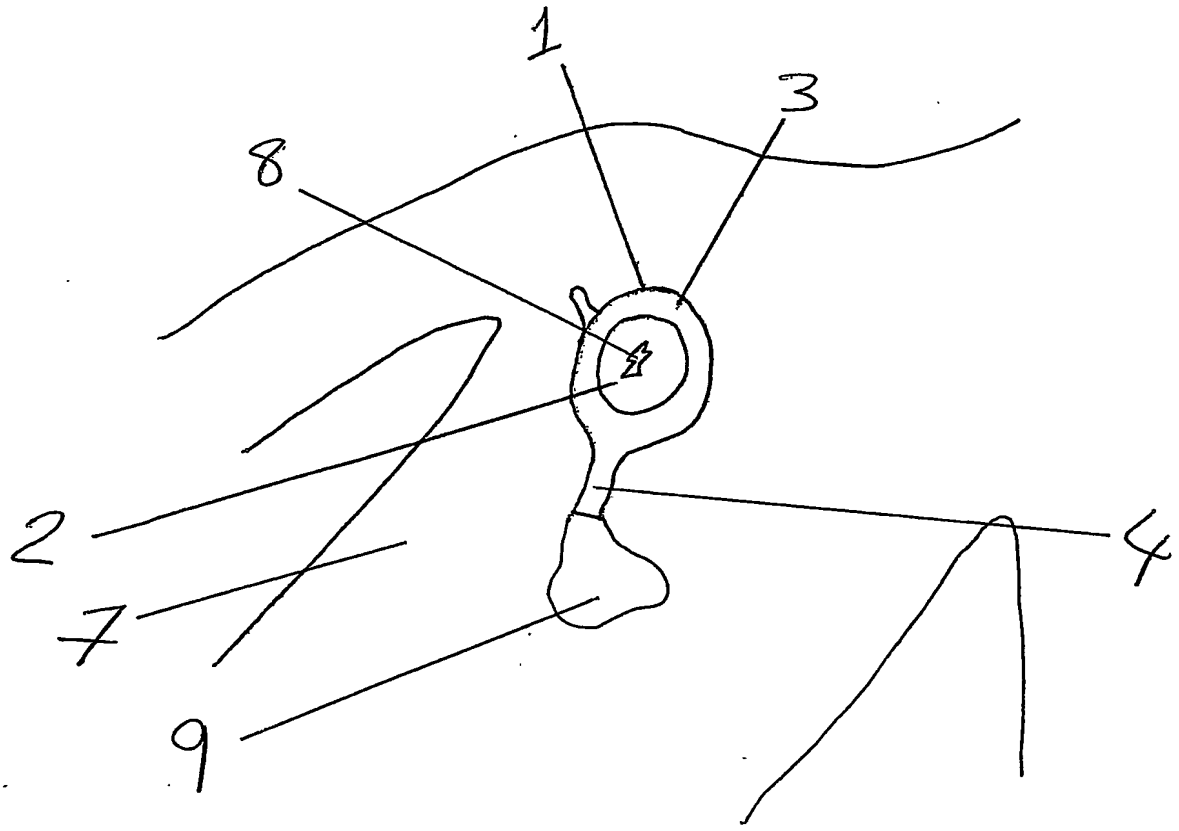

Fig 3

Novel Occlusive Dressing

The present invention relates to the field of occlusive dressings and, more specifically, to occlusive dressings which allow the escape of fluid and air in cases of penetrating thoracic trauma.

In the majority of cases where serious injury occurs, it is necessary to apply a dressing to the wound in question. In the cases of penetrating thoracic trauma, an object like a bullet, knife or metal fragment for example has penetrated the chest wall, or both the chest wall and the lung itself, exposing the pleural space to the atmospheric pressure of the outside environment.

In order for a patient to breathe, it is necessary to maintain a proper pressure differential between the pleural cavity and the outside environment. Normally, the visceral and parietal pleura are separated by the pleural space, which itself is filled with pleural fluid. Typically, during inspiration, the rib cage expands, pulling the pleural pleura away from the visceral pleura. A negative pressure in the pleural space then develops in

the lungs themselves, and positive atmospheric pressure forces air into the lungs.

When the normal negative pressure of the pleural space is exposed to the more positive atmospheric pressure in cases of trauma, outside air flows into the pleural space through the wound or through the punctured lung, causing a tension pneumothorax to develop. This is a very serious medical problem and eventually can result in the collapse of the lung, cardio-pulmonary collapse, unconsciousness, followed soon thereafter by cardio-pulmonary arrest and death.

It can therefore be seen that it is very important that a dressing be applied to the wound which prevents any air from entering the pleural space through the wound. However, at the same time, the dressing must allow air entering the pleural space through a punctured lung to escape from the wound, along with any blood that may have leaked into the pleural space as a result of the trauma. A dressing of this type would allow a patient to at least partially maintain the proper pressure differential between the pleural cavity and the outside environment.

In the past, a number of dressings have been described and used to try and deal with this issue. In the most basic sense, paramedics commonly use ad-hoc dressings created on-site, consisting of a piece of sterile plastic wrap taped on three sides, with the fourth side left open to allow air and fluid to escape. However, this is an extremely time consuming operation, and often results in the dressing being applied incorrectly, with can lead to a tension pneumothorax. Other dressings have been

described which include a valve protruding at 90° from the surface of the dressing. Again, this results in the application of the dressing being difficult, and also can cause problems for the applicator of the dressing, as discharges of bodily fluids are directed towards the applicator in this case. There is also the issue that when a valve protrudes from a dressing, it is difficult to apply a number of dressings to both, for example the front and rear of a patient, as in gun shot cases where there is both an entry and exit wound. There is also the issue that even in cases where the dressing itself allows visualisation of the wound, because the valve is protruding from the centre of the dressing, this obstructs the view of the wound.

It can be seen that it would be beneficial to be able to provide an occlusive dressing appropriate for use in penetrating thoracic trauma cases.

According to the present invention, there is provided a dressing comprising a bandage section, having a perimeter sufficient to occlude a wound, and a valve section that allows the escape of fluid, wherein the valve section lies substantially on the same plane as the bandage section.

Preferably the bandage section comprises a transparent area.

Preferably the outer edge of the bandage section comprises adhesive.

Preferably the valve section comprises a flutter valve.

Most preferably the flutter valve is housed in a substantially rigid casing.

Preferably the bandage section is substantially elliptical or circular in shape.

Preferably the bandage section is provided with an extending tag section allow for easy gripping.

Preferably the flutter valve can be provided with a collection bag.

Preferably the dressing is manufactured from non-allergenic material(s).

Optionally the dressing is manufactured from latex.

Optionally the valve is provided with a flushing system.

Preferably the flushing system comprises an aperture in the wall of the valve into which fluid can be inserted.

In order to provide a better understanding of the present invention, embodiments will now be described by way of example only and with reference to the following drawings, in which:

Figure 1 shows a plan view of a dressing according to the present invention;

Figure 2 shows a cross-section view of the flutter valve according to the preferred embodiment of the present invention; and

Figure 3 shows an example of the dressing in use according to the present invention.

In the preferred embodiment, there is provided a dressing 1, as can be seen in Figure 1. The dressing 1 is substantially elliptical in shape with regard to the bandage section 3, which provides it with ergonomic characteristics, making it easier to use than the standard square type bandages. The bandage section 3 is provided with a central transparent area 2, which allows the underlying wound 8 to be visualised by a paramedic or doctor, even whilst the dressing 1 is in use. A valve section 4 is provided which allows the exiting of unwanted air and fluids from the wound 8, whilst preventing the intake of air into the wound 8, which would disrupt the equilibrium in the pleural cavity.

Figure 2 is a brief diagram of the valve section 4. Here it can be seen that the valve section 4 is in the form of a flutter valve, wherein a valve leaflet 6 allows the escape of fluids, but does not allow the ingression of air. The flutter valve is provided with a rigid outer casing 5, which strongly reduces the likelihood of valve blockages, as well as making the valve section 4 generally more robust for use in emergency situations.

Figure 3 shows an example of the dressing 1 in use on a wound 8 position on the upper torso 7 of an individual. It can be seen that the dressing 1 is positioned over the

wound 8 with the ergonomic shape of the bandage section 3 and the transparent area 2, ensuring that the positioning of the dressing is both rapid and easy. Any air that is escaping from the wound 8, or any blood or liquid that is escaping due to the wound 8, is able to drain away through the valve section 4 on the dressing 1. However, the valve section 4 is a one-way valve, and therefore no air of liquid, etc., is able to regress back into the wound 8 from the external environment. Ideally, in the preferred embodiment, a collection bag 9 is positioned at the end of the valve section 4 to allow air and bodily fluids to be kept in one place. Typically this collection bag 9 will be provided with apertures or will be produced in the matter that allows gaseous exchange with the external environment.

The dressing 1 is designed in such a manner that it user friendly and can be manufactured in non-allergenic material, which increases the likelihood of adoption by medical and NHS staff. There are a number of benefits to this dressing 1 over and above dressings that have been suggested in the past. The ergonomic design of the dressing 1, along with the transparent area 2 that is not obstructed by the valve section 4 in any manner, increases the speed of application and reduces the time that it would take to deliver a patient to hospital, for example.

The described dressing 1 also does not require careful positioning on the patient in order to allow the wound 8 to breathe. As covering a wound 8 and stopping it from breathing can lead to tension pneumothorax, it is advantageous that even a speedy application of the

dressing 1 described in this invention would not cause this problem.

Another benefit to the dressing 1 described in the present invention is that the valve section 4 lies flat on the patient, as it is substantially on the same plane as the bandage section 3, rather than protruding horizontally, as in the case of previously described dressings. This protects the applicator of the dressing 1 from the discharge of bodily fluids which offers improved health and safety conditions for the applicator. It also has the major benefit of allowing dressings 1 to be applied to both the rear of the patient and the front of the patient, without resulting in discomfort or additional damage to the patient.

The transparent area 2 offers the applicator an unobstructed view of the wound 8, which is significantly beneficial over prior dressings, as it allows the applicator to monitor the condition of the wound 8, whilst still sealing the wound 8 and stopping air from penetrating, resulting in a sucking wound and the possibility of a tension pneumothorax. It also allows the applicator to visualise the wound 8, whilst reducing the possibility of infection or infectious agents penetrating the wound 8.

The dressing 1 described in the present invention can also be used as a pressure dressing to stem the flow of blood and improve the patient's situation. In order to further increase this aspect, it is possible to provide additional layers to the dressing which can be filled with air or fluid to provide constant tension.

Alternatively, additional gauze or material can be incorporated in the bandage section for comfort.

It is also worth noting that the use of a dressing 1, such as the one described, highlights the location and the possible type of wound 8 to the staff at a receiving hospital, allowing faster assessment of the wound 8.

The rigidity of the valve outer casing 5 is also very important, as it reduces the likelihood of valve blockages and decreases the likelihood of a tension pneumothorax. It also allows the dressing 1 to be handled much more roughly, standing up to the extreme conditions often faced in an emergency situation.

The dressing 1 is often provided with a large grip tag 10, which allows both easy removal of the dressing 1 when required, even whilst the person providing assistance is wearing gloves, and also allows the adhesive on the reverse of the dressing 1 to be uncovered easily, as typically it will be covered in an appropriate material prior to use, which is then quickly removed when the dressing is required to be fixed in place on a patient.

The irrigation flushing system is an optional embodiment of the present invention. In this case, the valve section 4 is made up of an outer section, as well the inner valve leaflets 6. As mentioned above in the preferred embodiment, the outer section comprises a rigid outer casing 5. If an irrigation flushing system is included, an aperture is provided in the outer section of the valve section 4 and, at intervals, liquid such as water or any other appropriate fluid, can be inserted

into the aperture and flushed through the valve section 4 to clean out the inside of the valve.

Another optional embodiment has a collection bag 9 attached to the base of the valve section 4, to allow the collection of any fluids.

In conclusion, the dressing described in the present invention has a number of benefits over the prior art. However, the abovementioned description should not be taken as being limiting, as further modifications and improvements can be made by one skilled in the art within the scope of the invention herein disclosed.